

LISTING OF CLAIMS:

This listing of claims will replace all prior versions of claims in the application:

1 1. (Cancelled) A magnetoresistive sensor comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned layer structure comprising CoFeV with an atomic percent  
4 of Fe ranging from 20-60 atomic percent and an atomic percent of V  
5 ranging from 2-10 atomic percent sandwiched between the first and  
6 second free layers, said magnetically pinned layer being self pinned;  
7 a first electrically insulating barrier layer sandwiched between said first  
8 magnetically free layer and said pinned layer; and  
9 a second electrically insulating barrier layer sandwiched between said second free  
10 layer and said pinned layer.

1 2. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 is pinned by a combination of magnetostriction of the pinned layer and compressive  
3 stress within the sensor.

1 3. (Currently amended) A magnetoresistive sensor as in claim 11 47 wherein said  
2 pinned layer comprises Co and Fe, wherein the atomic percent of Fe is about 50%.

1 4. (currently amended) A magnetoresistive sensor as in claim 11 47 wherein said  
2 pinned layer comprises CoFe with an atomic percent of Fe ranging from 20 to 60 percent.

1 5. (currently amended) A magnetoresistive sensor as in claim 11 47 wherein said  
2 pinned layer comprises CoFeV, with an atomic percent of Fe ranging from 20 to 60  
3 percent and an atomic percent of V ranging from 2 to 10 percent.

1 6. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 comprises a single ferromagnetic layer comprising Co and Fe.

1 7. (Withdrawn) A magnetoresistive sensor as in claim 1 wherein said pinned layer  
2 comprises a single ferromagnetic layer comprising Co, Fe and V.

1 8. (Cancelled)

1 9. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein said  
2 ~~three~~ ferromagnetic layers of said pinned layer comprise Co and Fe and wherein the  
3 atomic percent of Fe in each layer is 20 to 60 percent.

1 10. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein said  
2 ~~three~~ ferromagnetic layers of said pinned layer comprise Co, Fe and V and wherein the  
3 percentage of Fe in each layer ranges from 20 to 60 percent and wherein the atomic  
4 percentage of V ranges from 2 to 10 percent.

1 11. (currently amended) A magnetoresistive sensor comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned layer sandwiched between the first and second free layers,  
4 said magnetically pinned layer being self pinned;  
5 a first electrically insulating barrier layer sandwiched between said first  
6 magnetically free layer and said pinned layer; and  
7 a second electrically insulating barrier layer sandwiched between said second free  
8 layer and said pinned layer;  
9 wherein said pinned layer comprises first two outer ferromagnetic layers and one  
10 inner ferromagnetic layer layers, the outer and inner ferromagnetic layers  
11 comprising Co and Fe, said outer ferromagnetic layers having a thickness  
12 of about 5 angstroms and said inner ferromagnetic layer having a  
13 thickness of about 10 angstroms.

1 12. (Withdrawn) A magnetoresistive sensor as in claim 1, wherein said pinned layer  
2 comprises a single layer of ferromagnetic material comprising Co and Fe and  
3 wherein said single ferromagnetic layer has a thickness of 5 to 15 angstroms.

1 13. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein said  
2 barrier layers comprise Aluminum Oxide.

1 14. (currently amended) A magnetoresistive sensor as in claim 11-17, wherein said  
2 barrier layers comprise magnesium oxide.

1 15. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein at  
2 least one of said free layers comprises CoFe.

1 16. (currently amended) A magnetoresistive sensor as in claim 11 47, wherein at  
2 least one of said free layers comprises a layer of CoFe and a layer of NiFe, the  
3 CoFe layer being disposed closer to the pinned layer than the NiFe layer.

1 17. (currently amended) A magnetoresistive sensor as in claim 11 comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned sandwiched between the first and second free layers, said  
4 magnetically pinned layer being self pinned;  
5 a first electrically insulating barrier layer sandwiched between said first  
6 magnetically free layer and said pinned layer; and  
7 a second electrically insulating barrier layer sandwiched between said second free  
8 layer and said pinned layer;  
9 wherein said three ferromagnetic layers of said pinned layer are separated from  
10 one another by first and second non-magnetic coupling layers.

1 18. (previously presented) A magnetoresistive sensor as in claim 11 comprising:  
2 first and second magnetically free layers;  
3 a magnetically pinned sandwiched between the first and second free layers, said  
4 magnetically pinned layer being self pinned;

5 a first electrically insulating barrier layer sandwiched between said first  
6 magnetically free layer and said pinned layer; and  
7 a second electrically insulating barrier layer sandwiched between said second free  
8 layer and said pinned layer;  
9 wherein said three ferromagnetic layers of said pinned layer layers are separated from  
10 one another by first and second non-magnetic coupling layers comprising Ru.

19. (Withdrawn) A magnetic data storage system, comprising:

- a motor;
- a magnetic disk rotatably connected with said motor;
- a suspension;
- a slider connected with said suspension for movement adjacent to said disk;
- a magnetoresistive sensor, connected with said suspension, said magnetoresistive sensor further comprising:
  - first and second magnetically free layers;
  - a magnetically pinned layer sandwiched between the first and second free layers, said magnetically pinned layer being self pinned;
  - a first electrically insulating barrier layer sandwiched between said first magnetically free layer and said pinned layer; and
  - a second electrically insulating barrier layer sandwiched between said second free layer and said pinned layer.